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POSSIBLE HEALTH HAZARDS OF ASBESTOS WASTE FILE:
AMBLER, PENNSYLVANIA

by

George K. Tokuhata, Dr.P.H., Ph.D., Director*
Martha W. Smith, M.A.
Krishnan Ramaswamy, M.S., M.Sc.(Hygiene)
Linda Mann, B.A.

Bureau of Program Evaluation
Pennsylvania Department of Health

* Dr. Tokuhata is also Professor of Epidemiology & Biostatistics,
University of Pittsburgh Graduate School of Public Health(adjunct);
and Associate Professor of Community Medicine, Temple University
College of Medicine(adjunct).

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POSSIBLE HEALTH HAZARDS OF ASBESTOS WASTE PILE: AMBLER, PENNSYLVANIA

Introduction:

In February, 1975 the Bureau of Program Evaluation of the Pennsylvania Department of Health was requested by the Department of Environmental Resources through the Bureau of Adult Preventive Health Programs to look into the matter of possible health hazards of the asbestos waste pile, which is located in the Ambler Borough, Montgomery County, Pennsylvania.

This request was occasioned relative to the public meeting on this problem, scheduled for February 25, 1975. Presentations were made by representatives of the Pennsylvania Department of Environmental Resources, the Nicolet Company, the Borough of Ambler, and the American Cancer Society: Philadelphia Division. The Pennsylvania Department of Health participated as an observer.

This public hearing resulted in contradictory opinions expressed by various interests and concerns with respect to the true health hazards of the asbestos waste pile. [One consensus which emerged from the meeting was that there is need for further studies to scientifically determine whether or not the alleged health hazards do, in fact, exist in the community where the asbestos waste pile is located.] There was expressed a special concern regarding the incidence of a particular form of cancer of the respiratory system, namely, mesothelioma.

Preliminary Investigation:

As a preliminary investigation, the Bureau of Program Evaluation decided to analyze the pattern of mortality for the Borough of Ambler and its surrounding communities where there are potential health hazards, which may be related to the asbestos waste pile.

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In addition to Ambler Borough where the asbestos waste pile is actually located, five surrounding townships were included in this analysis; these were Lower Gwynedd, Upper Dublin, Whitpain, Whitemarsh, and Springfield. The entire geographic area comprising these six communities is situated northwest of Philadelphia in Montgomery County with an estimated total area of approximately 50 square miles.

For the purpose of this investigation, we used the existing mortality data based on death certificates filed in the State Health Department. Because of the fact that Ambler Borough has a small population against which mortality rates were to be calculated, an average annual death rate, rather than simple annual death rate, was used.

A. Death Rates by 15 Groups of Causes: 1968-1973 Annual Average

Because of the fact that the Ambler population is small, it was decided to analyze mortality rates by 15 different groups of causes, rather than by single causes. Furthermore, in order to ascertain more stable (statistically) mortality rates, the 1968-1973 (6-year) period was considered.

Specifically, the 1968-1973 average annual cause-specific mortality rates were computed for each of the following three populations: the Borough of Ambler; the 6-community area; and the State of Pennsylvania. For this purpose the 1970 census populations of these three areas were used respectively as denominator.

The fifteen groups of causes of death being analyzed separately consisted of the following:

1. Malignant neoplasms of the buccal cavity and pharynx.
2. Malignant neoplasms of the digestive organs and peritoneum.

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3. Malignant neoplasms of the respiratory system.
4. Malignant neoplasms of the bone, connective tissue, skin, and breast.
5. Malignant neoplasms of the genital organs.
6. Malignant neoplasms of the urinary organs.
7. Malignant neoplasms of other and unspecified sites.
8. Neoplasms of the lymphatic and hematopoietic tissues.
9. Ischemic heart diseases.
10. Other forms of heart diseases.
11. Cerebrovascular diseases.
12. Diseases of the arterios, arterioles, and capillaries.
13. Diseases of the veins, lymphatics, and other diseases of the circulatory system.
14. Bronchitis, emphysema, and asthma.
15. Other diseases of the respiratory system.

In order to perform a significance test for a difference between Ambler and Pennsylvania as a whole, we employed the assumption that the probability of death due to certain selected causes follows a Poisson distribution. More specifically, we first counted the number of cause-specific deaths actually observed in Ambler and then computed the number of deaths attributed to the same causes that might be expected in Ambler, each being considered to be a Poisson variate. The expected number of deaths was computed from the experience of Pennsylvania as a whole holding the age factor constant. The ratio of these two Poisson variates also follows a Poisson distribution. Finally, the ratio of the observed to the expected measures was tested for a statistical significance. (Reference: Bailar, John C., III and Ederer, Fred.: Significance

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Factors for the Ratio of a Poisson Variable to its Expectation. Biometrics, September 1964, pp. 639-643)

The results of our analyses of the data pertaining to the 15 groups of causes of death are presented in the Tables 1 through 15.

As indicated in Table 1, the 1968-1973 average annual number of deaths (observed) due to malignant neoplasms of the buccal cavity and pharynx was only 0.6 for Ambler; the number was 2.8 for the 6-community area and 482.6 for Pennsylvania as a whole. The expected number of deaths for Ambler was 0.33; this was not computed for the 6-community area because information regarding age distribution in townships was not available. [The crude death rate was 8.5 per 100,000 for Ambler, 3.8 per 100,000 for the 6-community area, and 4.1 per 100,000 for 7.5 vs. 4.1 Pennsylvania as a whole.] The result of our significance test indicates that, although the crude death rate for Ambler appears to be higher than that for Pennsylvania as a whole, this difference may well be due to chance variations. ?

Likewise, we found no significant differences between Ambler and Pennsylvania with respect to any of the remaining 14 groups of causes of death; this included malignant neoplasms of the respiratory system which were thought by some observers to be of possible significance. However, we were unable to single out mesothelioma, a rare tumor of the pleura either benign or malignant, which has been linked to chronic exposure to asbestos. This was, in part, due to the small population of the Borough of Ambler.

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B. Death Rates by Nine Groups of Causes: 1969-1971 Annual Average

In order to ascertain more accurate death rates than those discussed earlier, we reanalyzed the available mortality data for the 1969-1971(3-year) period. These three years were chosen so that we were able to apply the 1970(mid-point for the 3-year period) census population more effectively to each of the same three geographic areas, namely, Ambler, the 6-community area, and Pennsylvania, to compute death rates. For these analyses we considered nine selected groups of causes of death. This regrouping of causes was necessary in order to have sufficiently large numbers of deaths, particularly cancer deaths, which took place during the 3-year period rather than the 6-year period as considered in the previous analyses.

The nine groups of causes of death mentioned above consisted of the following:

1. Malignant neoplasms of the buccal cavity and pharynx; the digestive organs and peritoneum; and the respiratory system.
2. Malignant neoplasms of the bone, connective tissue, skin, and breast.
3. Malignant neoplasms of the genito-urinary organs; other and unspecified sites; neoplasms of the lymphatic and hematopoietic tissue; and benign neoplasms.
4. Ischemic heart diseases.
5. Other forms of heart diseases; and cerebrovascular diseases.
6. Diseases of the arteries, arterioles, and capillaries.
7. Diseases of the veins, lymphatics, and other diseases of circulatory system.
8. Bronchitis, emphysema, and asthma.
9. Other diseases of the respiratory system.

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The results of analyses of the 1969-1971(3-year) average data are summarized in Tables 16 through 24. As can be seen from these data, the pattern of mortality differences between Ambler and the State of Pennsylvania as a whole remained the same for each of the nine selected groups of causes. None of the nine differences was statistically significant, although there may appear to be some differences.

* Summary and Conclusions:

In the absence of useful morbidity data for the Borough of Ambler and its immediate vicinity, the existing mortality statistics were used for the present study. Since Ambler has a small population(7,800 in 1970) we used annual average data rather than single year data in computing death rates. Also, it was necessary to group certain causes of death rather than considering specific single causes separately.

In computing death rates we employed 1970 census population, the only accurate base population data available for this purpose.

The 1968-1973(6-year) average death rates reflect more complete mortality trends, but are based on the assumption that the base population remained stable during this period. In contrast, the 1969-1971(3-year) average death rates reflect only what happened during the 3-year period, but the base population is more accurate, thus the level of mortality rates is likewise more accurate. In both cases we were able to take the age composition of the population into account when Ambler and Pennsylvania were compared. However, it was not possible to consider any other factors, such as socioeconomic characteristics, in comparing death rates between these two areas.

The results of our mortality analyses indicate that, although crude death rates from certain causes appear to be higher in Ambler than in Pennsylvania

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as a whole, none of these differences was statistically significant, i.e., such differences can be explained in terms of chance variations.

Significance tests which we employed were based on the assumption that the probability of death due to certain specific causes follows a Poisson distribution, and the test criterion used was a ratio of two age-adjusted Poisson variates.

It has long been recognized that the extended occupational exposure to asbestos can be related to the development of mesothelioma, an original tumor, either benign or malignant, mostly of the respiratory system, particularly of the pleura. However, this disease is rare and is not coded specifically as such in our cause-of-death coding system. Therefore, we were only able to analyze a broad group of causes which would include mesothelioma. However, our analyses do not suggest any clear evidence that the mortality due to mesothelioma was significantly higher in the Borough of Ambler or in its surrounding communities than might be expected.

It is well recognized in Pennsylvania that, for reasons not completely understood, there is a rather consistent tendency of more deaths being reported in cities and boroughs than should be (or fewer deaths being reported in townships than should be). We were unable to determine the extent of this particular bias in reporting and recording deaths according to the type of municipality which might have upgraded the true level of death rates for the Borough of Ambler as compared with the surrounding townships which we considered. It should be noted that the death rates for the entire 6-community area considering Ambler Borough and five surrounding townships together were quite similar to those for the State of Pennsylvania.

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This report is limited in that only mortality data based on death certificates were analyzed. Adequate morbidity data, if available, would have presented a more complete evaluation of the issue. Ascertainment of such morbidity data for the area and for a comparable control area, however, would be extremely costly and time-consuming; and such an attempt may not be indicated in view of the findings presented in this brief report.

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TABLE 1: MALIGNANT NEOPLASM OF BUCCAL CAVITY AND PHARYNX

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths			
			Observed	Expected		
Ambler Borough	7,800	8.5	0.67	0.33	2.03	p>0.05
6-Community Area*	74,442	3.8	2.83	-	-	-
Pennsylvania	11,793,909	4.1	482.67	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 2: MALIGNANT NEOPLASM OF DIGESTIVE ORGANS AND PERITONEUM

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	91.9	7.17	4.69	1.51	p>0.05
6-Community Area*	74,442	48.4	36.00	-	-	-
Pennsylvania	11,793,909	56.6	6678.17	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitemarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 3: MALIGNANT NEOPLASM OF RESPIRATORY SYSTEM

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973 Number of Deaths		Ratio O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	49.1	3.83	2.81	1.35	p>0.05
6-Community Area*	74,442	33.1	24.67	-	-	-
Pennsylvania	11,793,909	38.1	4495.67	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whiteland, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 4: MALIGNANT NEOPLASMS OF BONE, CONNECTIVE TISSUE, SKIN, AND BREAST

Annual Average: 1968-1973						
Location	1970 Population	Crude Death Rate**	Number of Deaths		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	38.5	3.00	1.74	1.72	p<0.05
6-Community Area*	74,442	26.0	19.33	-	-	-
Pennsylvania	11,793,909	21.7	2555.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 5: MALIGNANT NEOPLASM OF GENITAL ORGANS

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	42.7	3.33	1.81	1.82	p>0.05
6-Community Area*	74,442	20.4	15.17	-	-	-
Pennsylvania	11,793,909	22.6	2660.67	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 6: MALIGNANT NEOPLASM OF URINARY ORGANS

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	8.5	0.67	0.74	0.91	p>0.05
6-Community Area*	74,442	8.3	6.00	-	-	-
Pennsylvania	11,793,909	8.9	1044.83	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 7: MALIGNANT NEOPLASMS OF OTHER AND UNSPECIFIED SITES

Location	1970 Population	Crude Death Rate**	Annual Average: 1960-1973		Ratio O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	10.7	0.83	1.62	0.49	p>0.05
6-Community Area*	74,442	16.1	12.00	-	-	-
Pennsylvania	11,793,909	20.2	2 385.17	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitemarsh, Springfield, and Ambler Borough

** Rate per 100,000 population

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 8: NEOPLASMS OF LYMPHATIC AND HEMATOPOIETIC TISSUE

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,600	19.2	1.50	1.39	1.08	$p > 0.05$
6-Community Area*	74,442	19.5	14.50	-	-	-
Pennsylvania	11,793,909	17.2	2032.50	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whittemarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 9: ISCHEMIC HEART DISEASE

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973 Number of Deaths		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	542.7	42.33	35.53	1.19	p>0.05
6-Community Area*	74,442	333.6	248.33	-	-	-
Pennsylvania	11,793,909	411.3	48509.67	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 10: OTHER FORMS OF HEART DISEASE

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	40.6	3.17	1.75	1.77	$p > 0.05$
6-Community Area*	74,442	20.1	15.00	-	-	-
Pennsylvania	11,793,909	21.4	2518.17	-	-	-

* Includes: Lower Gwyn dd, Upper Dublin, Whitpain, Whitemarch, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 11: CEREBROVASCULAR DISEASE

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	151.7	11.83	9.63	1.23	p>0.05
6-Community Area*	74,442	87.3	65.00	-	-	-
Pennsylvania	11,793,909	106.7	12589.50	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 12: DISEASES OF ARTERIES, ARTERIOLES, AND CAPILLARIES

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths			
			Observed	Expected		
Ambler Borough	7,800	.32.1	.2.50	3.10	0.81	p>0.05
6-Community Area*	74,442	23.1	17.17	-	-	-
Pennsylvania	11,793,909	33.4	3939.50	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 13: DISEASES OF VEINS, LYMPHATICS, AND
OTHER DISEASES OF CIRCULATORY SYSTEM

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	15.0	1.17	0.95	1.16	$p > 0.05$
6-Community Area*	74,442	7.2	5.33	-	-	-
Pennsylvania	11,793,909	11.6	1370.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitemarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 14: BRONCHITIS, EMPHYSEMA, AND ASTHMA

Annual Average: 1968-1973						
Location	1970 Population	Crude Death Rate**	Number of Deaths		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,600	8.5	0.67	1.15	0.58	p>0.05
6-Community Area*	74,442	11.2	8.33	-	-	-
Pennsylvania	11,793,909	13.4	1585.17	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whittemarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 15: OTHER DISEASES OF RESPIRATORY SYSTEM

Location	1970 Population	Crude Death Rate**	Annual Average: 1968-1973		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	17.1	1.33	1.58	0.82	p>0.05
6-Community Area*	74,442	7.8	5.83	-	-	-
Pennsylvania	11,793,909	21.1	2489.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whittemarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 16: MALIGNANT NEOPLASMS OF BUCCAL CAVITY AND PHARYNX;
DIGESTIVE ORGANS AND PERITONEUM; AND RESPIRATORY SYSTEM

Annual Average: 1969-1971						
Location	1970 Population	Crude Death Rate**	Number of Deaths		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	157.7	12.33	7.83	1.57	p>0.05
6-Community Area*	74,442	86.4	64.33	-	-	-
Pennsylvania	11,793,909	97.0	1144.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitemarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 17: MALIGNANT NEOPLASMS OF BONE, CONNECTIVE TISSUE, SKIN, AND BREAST

Annual Average: 1969-1971						
Location	1970 Population	Crude Death Rate**	Number of Deaths		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	42.3	3.33	1.74	1.90	p>0.05
6-Community Area*	74,442	25.0	18.67	-	-	-
Pennsylvania	11,793,909	22.0	259.17	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 18: MALIGNANT NEOPLASMS OF GENITOURINARY ORGANS; OTHER AND UNSPECIFIED SITES;
NEOPLASMS OF LYMPHATIC AND HEMATOPOIETIC TISSUE; AND BENIGN NEOPLASMS

Annual Average: 1969-1971						
Location	1970 Population	Crude Death Rate**	Number of Deaths		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	93.6	7.33	5.84	1.25	p>0.05
6-Community Area*	74,442	64.9	48.33	-	-	-
Pennsylvania	11,793,909	68.6	8096.00	-	-	-

* Includes Gwynedd, Upper Dublin, Whitpain, Whittemarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 19: ISCHEMIC HEART DISEASE

Location	1970 Population	Crude Death Rate**	Annual Average: 1969-1971		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	542.3	42.33	35.53	1.19	p>0.05
6-Community Area*	74,442	317.8	236.67	-	-	-
Pennsylvania	11,793,909	406.8	47972.00	-	-	-

* Includes Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 20: OTHER FORMS OF HEART DISEASE; AND CEREBRO-VASCULAR DISEASE

Annual Average: 1969-1971						
Location	1970 Population	Crude Death Rate**	Number of Deaths		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	170.5	13.33	11.38	1.17	p>0.05
6-Community Area*	74,442	104.2	77.67	-	-	-
Pennsylvania	11,793,909	126.8	14949.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield and Ambler Borough

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 21: DISEASES OF ARTERIES, ARTERIOLES, AND CAPILLARIES

Location	1970 Population	Crude Death Rate**	Annual Average: 1969-1971		Ratio: O/E	Probability
			Number of Deaths Observed	Expected		
Ambler Borough	7,800	12.8	1.00	3.10	0.32	$p > 0.05$
6-Community Area*	74,442	18.3	13.67	-	-	-
Pennsylvania	11,793,909	33.4	3934.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 22: DISEASES OF VEINS, LYMPHATICS, AND OTHER DISEASES OF CIRCULATORY SYSTEM

Location	1970 Population	Crude Death Rate**	Annual Average: 1969-1971 Number of Deaths		Ratio: O/E	Probability
			Observed	Expected		
Ambler Borough	7,800	7.7	0.67	0.95	0.71	p>0.05
6-Community Area*	74,442	6.7	5.00	-	-	-
Pennsylvania	11,793,909	11.5	1353.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitemarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 23: BRONCHITIS, EMPHYSEMA, AND ASTHMA

Annual Average: 1969-1971						
Location	1970 Population	Crude Death Rate**	<u>Number of Deaths</u> Observed Expected		Ratio: O/E	Probability
Ambler Borough	7,800	12.8	1.00	1.15	0.87	p>0.05
6-Community Area*	74,442	12.5	9.33	-	-	-
Pennsylvania	11,793,909	14.0	1656.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitmarsh, Springfield, and Ambler Borough.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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TABLE 24: OTHER DISEASES OF RESPIRATORY SYSTEM

Location	1970 Population	Crude Death Rate**	Annual Average: 1969-1971		Ratio: O/E	Probability
			Number of Deaths			
			Observed	Expected		
Ambler Borough	7,800	12.8	1.00	1.58	0.63	p>0.05
6-Community Area*	74,442	11.6	8.67	-	-	-
Pennsylvania	11,793,909	28.7	3380.00	-	-	-

* Includes: Lower Gwynedd, Upper Dublin, Whitpain, Whitetown, Springfield, and Ambler population.

** Rate per 100,000 population.

Note: The expected number of deaths for Ambler was derived from the 1970 experience of Pennsylvania as a whole.

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